

**bart
impact
program**

Land Use and Urban Development Project

STUDY OF BART'S CONSTRUCTION IMPACTS



The BART Impact Program is a comprehensive, policy-oriented study and evaluation of the impacts of the San Francisco Bay Area's new rapid transit system (BART).

The program is being conducted by the Metropolitan Transportation Commission, a nine-county regional agency established by state law in 1970.

The program is financed by the U. S. Department of Transportation, the U. S. Department of Housing and Urban Development, and the California Department of Transportation. Management of the Federally funded portion of the program is vested in the U. S. Department of Transportation.

The BART Impact Program covers the entire range of potential rapid transit impacts, including impacts on traffic flow, travel behavior, land use and urban development, the environment, the regional economy, social institutions and life styles, and public policy. The incidence of these impacts on population groups, local areas, and economic sectors will be measured and analyzed. Finally, the findings will be interpreted with regard to their implications for the planning of transportation and urban development in the Bay Area and other metropolitan areas.

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LAND USE AND URBAN DEVELOPMENT PROJECT
STUDY OF BART'S CONSTRUCTION IMPACTS



April 1978

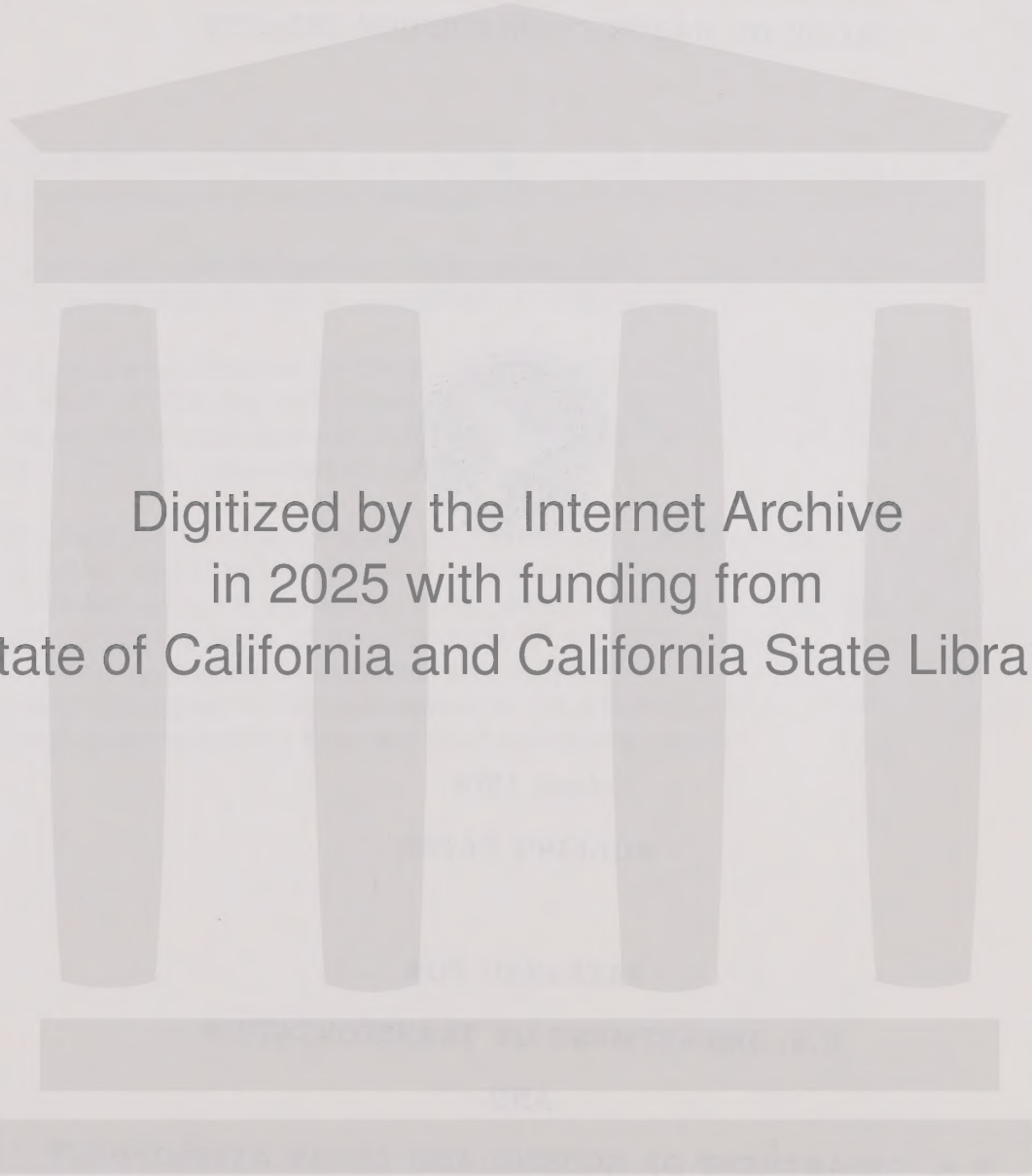
WORKING PAPER

PREPARED FOR

U.S. DEPARTMENT OF TRANSPORTATION

AND

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT



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A JOINT VENTURE

UNDER CONTRACT WITH THE METROPOLITAN TRANSPORTATION COMMISSION

FOR THE U.S. DEPARTMENT OF TRANSPORTATION

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16. Abstract <p>This study examines the effects that BART's construction activities had upon retail sales and services and upon real property. Key informant interviews were supplemented by longitudinal data on taxable retail sales and on permits for construction in areas near BART. Many retail merchants near the sites of BART cut-and-cover construction claimed to have suffered losses in sales during the period. The Mission District (San Francisco) and the Ashby station area (Berkeley) show the most distinct signs of losses linked to BART construction. Property owners and builders were found not to have deferred or eliminated maintenance, rehabilitation or new construction near BART construction.</p>					
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BART: The Bay Area Rapid Transit System

Length: The 71-mile system includes 20 miles of subway, 24 miles on elevated structures and 27 miles at ground level. The subway sections are in San Francisco, Berkeley, downtown Oakland, the Berkeley Hills Tunnel and the Transbay Tube.

Stations: The 34 stations include 13 elevated, 14 subway and 7 at ground level. They are spaced at an average distance of 2.1 miles: stations in the downtowns are less than one-half mile apart while those in suburban areas are two to four miles apart. Parking lots at 23 stations have a total of 20,200 spaces. There is a fee (25 cents) at only one of the parking lots. BART and local agencies provide bus service to all stations.

Trains: Trains are from 3 to 10 cars long. Each car is 70 feet long and has 72 seats. Top speed in normal operations is 70 mph with an average speed of 36 mph including station stops. All trains stop at all stations on the route.

Automation: Trains are automatically controlled by the central computer at BART headquarters. A train operator on board each train can override automatic controls in an emergency.

Magnetically encoded tickets with values up to \$20 are issued by vending machines. Automated fare gates at each station compute the appropriate fare and deduct it from the ticket value. At least one agent is present at each station to assist patrons.

Fares: Fares range from 25 cents to \$1.45, depending upon trip length. Discount fares are available to the physically handicapped, children 12 and under, and persons 65 and over.

Service: BART serves the counties of Alameda, Contra Costa and San Francisco, which have a combined population of 2.4 million. The system was opened in five stages, from September, 1972, to September, 1974. The last section to open was the Transbay Tube linking Oakland and the East Bay with San Francisco and the West Bay.

Routes are identified by the terminal stations: Daly City in the West Bay, Richmond, Concord and Fremont in the East Bay. Trains operate from 6:00 a.m. to midnight on weekdays, every 12 minutes during the daytime on three routes: Concord-Daly City, Fremont-Daly City, Richmond-Fremont. This results in 6-minute train frequencies in San Francisco, downtown Oakland and the Fremont line where routes converge. In the evening, trains are dispatched every 20 minutes on only the Richmond-Fremont and Concord-Daly City routes. Service is provided on Saturdays from 9 a.m. to midnight at 15-minute intervals. Future service will include a Richmond-Daly City route and Sunday service. Trains will operate every six minutes on all routes during the peak periods of travel.

Patronage: Approximately 142,000 one-way trips are made each day. Approximately 200,000 daily one-way trips are anticipated under full service conditions.

Cost: BART construction and equipment cost \$1.6 billion, financed primarily from local funds: \$942 million from bonds being repaid by the property and sales taxes in three counties, \$176 million from toll revenues of transbay bridges, \$315 million from federal grants and \$186 million from interest earnings and other sources.

March 1978

PREFACE

The BART Impact Program (BIP) is a comprehensive policy-oriented effort to identify, describe, measure, and present findings as accurately as possible about the multi-faceted impacts of a major public transportation investment—the BART system. The major objective of the Land Use and Urban Development Project is to determine how and to what extent BART has influenced the spatial arrangements of people and activities within the San Francisco Bay Area. To accomplish this task, the project will focus on the way BART has influenced (1) location decision processes; (2) actual movement behavior that results from those decisions and other market forces; and (3) the form, character, and functioning of aggregate spatial groupings that represent the net outcome of those decisions and movement patterns. Changes attributable to BART will be measured against pre-BART and no-BART alternatives. In all of these studies BART's effects on individual socio-economic groups, particularly minorities and the disadvantaged, will receive careful attention.

The Land Use and Urban Development Project is one of six major projects comprising the BART Impact Program. The others are:

- Economics and Finance Project (E&F)
- Environment Project (Env)
- Institutions and Lifestyle Project (ILS)
- Public Policy Project (PP)
- Transportation System and Travel Behavior Project (TSTB)

Each of these projects is designed to investigate specific aspects of BART's impacts, to explain why the impacts occur, and to identify who is affected by the impacts and the distributional effects. The projects then will demonstrate how the information derived can be used by decision-makers to enhance the benefits and to reduce the dis-benefits of BART and to increase understanding of the potential impacts of rail rapid transit investments in the Bay Area and other American metropolitan areas.

This working paper presents the analysis and findings of the study of BART's construction impacts—one aspect of BART's impacts on land use and urban development. The paper is presented for review by BART Impact Program staff, federal sponsors, and other interested planners and researchers.

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SUMMARY AND FINDINGS

The purpose of this study is to investigate retrospectively the types and extent of disturbance to retail sales and real property that were caused by BART's construction activities. Three types of analysis are employed: evaluation of key informant interviews conducted for other facets of the BART Impact Program, review of relevant documents contemporary with BART construction, and quantitative analysis of longitudinal data on retail sales and building permits in areas near BART construction.

The most important limitations of the methods employed are (1) potential recall problems or biases in key informant interviews, (2) the late start (1970) of initial sales tax data collection in the special Bucklin sample,¹ which permits valid pre-construction/construction comparisons, (3) shortcomings of the retail sales sample itself, primarily related to turnovers and closings, (4) incomplete building permit data for office construction, and (5) highly aggregated data for housing construction permits.

Two main hypotheses are addressed in this working paper. A brief summary of our findings concerning each is presented below.

HYPOTHESIS 1: During BART's construction period, retail sales and services businesses near BART lost sales that otherwise would have been made.

Key informant interviews, contemporary documents, and litigation indicate that many businesses near BART were detrimentally affected by the construction. Losses of sales attributed to construction activities were mostly blamed on impaired pedestrian or vehicular access. Retailers in suburban locations appear to have been less affected than those near BART's heavy construction activities in the cities. Cut-and-cover construction was utilized for subway stations in San Francisco, central Oakland and Berkeley, for underground line segments between 16th and 24th Streets in San Francisco, and for much of the underground line through Oakland. As expected, with the exception of downtown Berkeley, merchants in these areas appear to have been the ones most adversely affected. In both downtown Oakland and Richmond, redevelopment was concurrent with BART construction and it is difficult to isolate the effects of either activity.

In the downtowns of San Francisco, Oakland and Berkeley, sales tax data comparing retail stores near BART with other retail stores do not clearly show that the near-BART sales were depressed during construction. The data do not extend back further than 1970, however, and therefore may not adequately represent the construction period, and certainly do not indicate pre-construction trends. Other sales data for the City of Berkeley are perhaps more revealing. The Ashby

1. Refers to the sample of stores that was designed by Louis Bucklin. See Louis P. Bucklin, BART-II, Part IV, Impact on Retail Sales, IURD, U.C. Berkeley, June 1973.

station area shows a marked drop in sales coincident with BART construction, and failure in later years to recover from that decline. Informants indicate that the decline was indeed due to disruption caused by BART construction. In downtown Berkeley, the data show declines before, during, and after BART construction. Coupled with informants' observations, we conclude that BART's construction activities had little effect on the sales of downtown Berkeley.

Stores located in areas serving low-income and minority groups (e.g., blacks in the Ashby station and Latinos in the Mission District) were more adversely affected than were stores in other locations.

HYPOTHESIS 2: During BART's construction period, property owners and builders deferred or eliminated maintenance, rehabilitation, and new construction near BART.

Neither key informant interviews nor building permit data support this hypothesis. Without exception, informants stated that BART's construction activities had absolutely no effect on their decisions to maintain or rehabilitate buildings near BART, and that the construction did not deter them from undertaking new construction. On the contrary, groundbreaking for BART was thought to have encouraged builders to commit to new office construction in downtown San Francisco, and some informants asserted that their housing developments in the East Bay were timed to coincide with the end of BART construction, or the initiation of service.

In only one area—downtown/West Oakland—did building permits exhibit a definite downward trend during BART construction. The decrease in permit activity there, however, may have been caused at least in part by redevelopment in the 12th Street station area which began midway through BART construction. Although the downtown/West Oakland area has a high concentration of blacks, evidence is insufficient to reach any conclusions regarding differential effects on minorities.

1. INTRODUCTION

BART's construction activities were known to have caused inconvenience and considerable disruption, particularly in the downtowns of San Francisco, Oakland, and Berkeley. The purpose of this study is to investigate retrospectively the types and extent of disturbance caused by BART construction to retail sales and real property. The two primary questions addressed are (1) whether during BART's construction retail sales and services businesses near BART lost sales which otherwise would have been made, and (2) whether during BART's construction property owners and builders deferred or eliminated new construction near BART. The related issue of property damage associated with BART construction is also examined.

The study primarily utilizes three types of analysis. Key informant interviews conducted for other facets of the BART Impact Program were reviewed to extract information relevant to the construction period. Documentation of the construction period in BART and other public files and in subsequent lawsuits were examined and summarized. In addition, we compiled and analyzed longitudinal data on retail sales and building permit applications in areas near BART construction.

Before proceeding to a detailed account of the study's methods and the resultant findings, a brief description of BART's construction activities is appropriate.

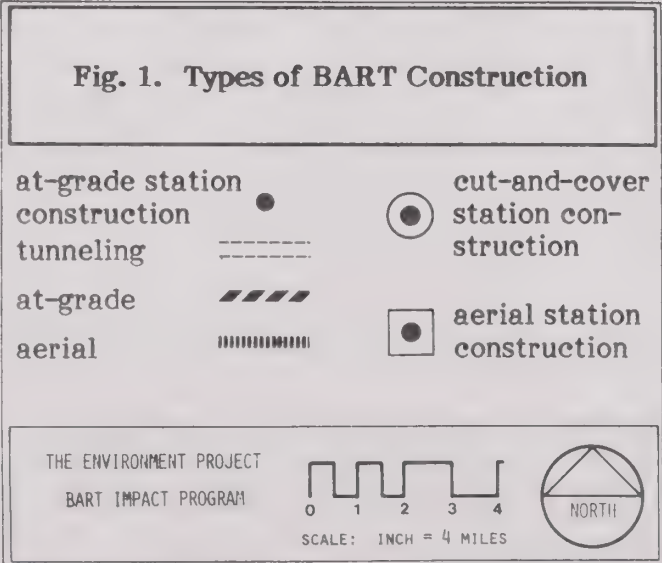
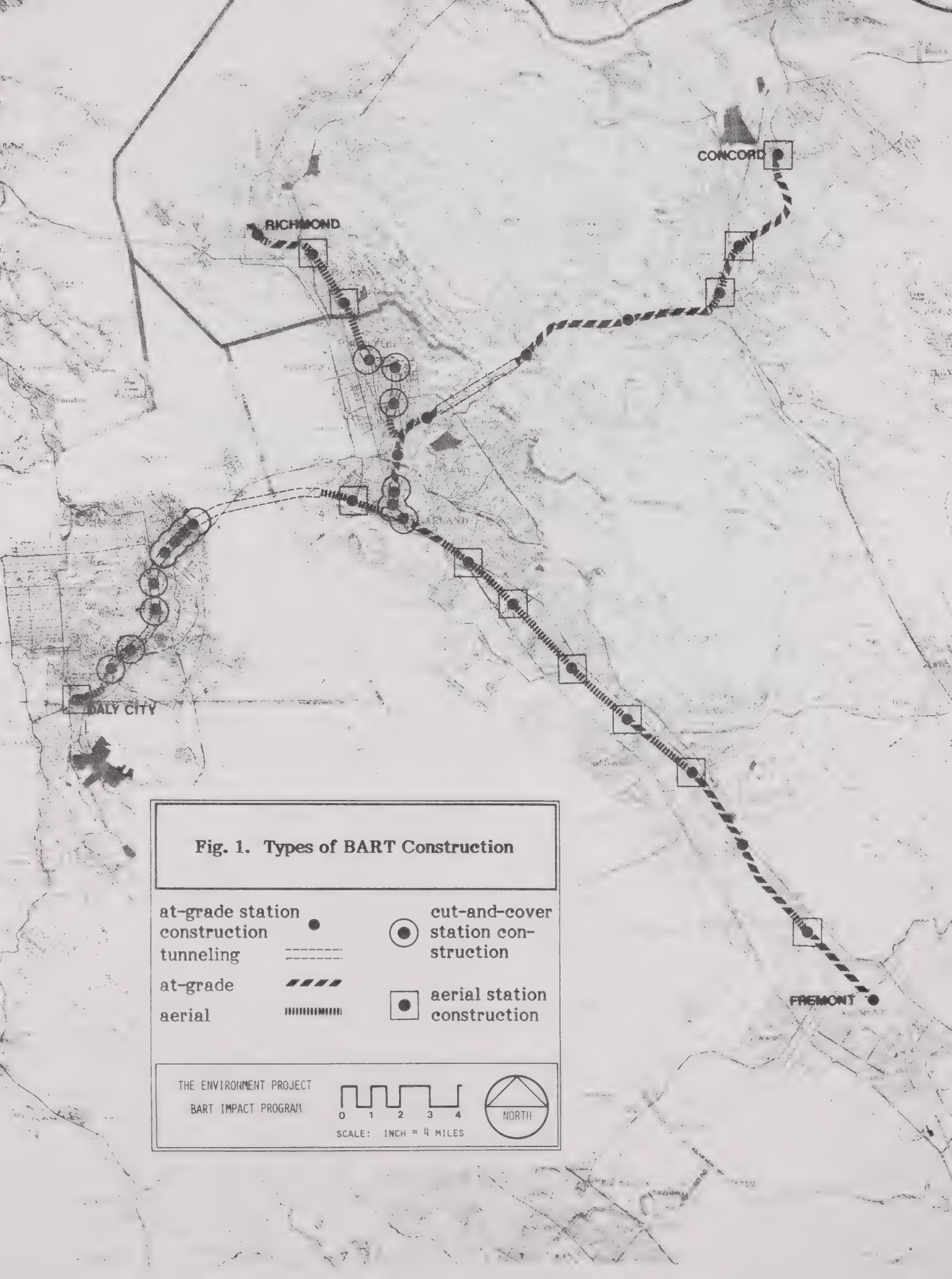
There were basically four forms of BART construction (see **Figure 1**). At-grade and aerial construction generally occurred in the suburban locations, while tunneling was primarily confined to the cities' downtown line segments, and to the trans-Bay portion of the line.

Cut-and-cover construction was used for subway station areas in San Francisco, central Oakland and Berkeley for underground line segments between 16th and 24th Streets in San Francisco, and for much of the underground line through Oakland.

The Environmental Project of the BART Impact Program has found that at-grade line construction was short-lived and only minimally disruptive to the surrounding area.² Physical impacts of the aerial line and of suburban station area construction were judged to be greater, but still of only minor consequence when compared to the disturbance in the central cities. There, the most disruptive mode of construction coincided with the greatest concentrations of people and the heaviest travel. **Table 1** shows the dates of station construction for San Francisco, Oakland, and Berkeley.

Downtown San Francisco was particularly disrupted by BART construction. Sta-

2. Gruen Associates, Inc. and DeLeuw, Cather & Company, Environmental Impacts of BART - Final Report, Chapter III. Report No. DOT-BIP-FR-7-4-77. (Springfield, Virginia: National Technical Information Service, August 1977).



tion construction on Market Street lasted about five years, with the station-shell construction (the period of greatest disruption) lasting about three years, from mid-1967 to 1971. During this period, many facets of life on Market Street were directly affected, for example:

1. Municipal Railway busses, streetcars, and trolleys were repeatedly rerouted from Market Street as the street itself was torn up
2. bus stops were temporarily eliminated or moved
3. private automobile traffic was banned from various segments of Market Street, while on other segments crossing was permitted over temporary steel plates decking the construction below
4. construction equipment and debris created obstacles for pedestrians
5. barricade-like retaining walls were constructed in front of some buildings
6. sidewalks were partially narrowed, and in places torn up and replaced by ramps

Taken together, these factors tended to confuse pedestrians and users of public transit, impair the accessibility of places of business, decrease on-street parking, reduce the visibility of storefronts and detract from the aesthetics of the immediate area.

TABLE 1. CUT-AND-COVER STATION CONSTRUCTION DATES

<u>Station</u>	<u>Construction of Station Shell</u>	<u>Substantial Completion of Station</u>
SAN FRANCISCO (downtown)		
Embarcadero	6/71-10/72	5/73- 5/76
Montgomery Street	7/67- 9/70	6/70- 2/72
Powell Street	8/67- 8/71	6/70- 5/72
Civic Center	5/67- 2/71	8/70- 6/72
SAN FRANCISCO (Mission)		
16th Street	12/67- 6/70	7/70-12/71
24th Street	12/67- 5/70	6/70-12/71
OAKLAND (downtown)		
12th Street	2/67-10/69	2/70- 9/71
19th Street	1/67-10/69	2/70- 9/71
BERKELEY (downtown)		
Berkeley	10/66- 1/69	4/70- 7/71

SOURCE: BART construction contracts.

Just as most of the station work was being completed in downtown San Francisco, the Market Street beautification project was initiated. The project, sponsored by a 2.4 million dollar bond issue, extended 2.2 miles from the Ferry Building to the Central Freeway overpass. Streetwork began in January, 1972, and was largely completed five years later.³ Since the project entailed significant reconstruction of sidewalk areas, it effectively doubled the span of time when activity on Market Street was disrupted. The beautification effort was given impetus by plans for BART, and would not have proceeded in its absence.⁴ The impacts of the Market Street beautification project should, then, be viewed as extensions of impacts resulting directly from BART construction.⁵

It has been noted that the physical impacts of BART construction were primarily felt no more than one-half⁶ to one block⁷ from the site. Thus, the following analyses focus on areas which were in the immediate vicinity (within one block) of major BART construction activities.

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3. At the date of this writing (March, 1978), the U.N. Plaza at Civic Center is still under construction.
 4. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Office Construction Industry (Berkeley, BART Impact Program Land Use and Urban Development Project Working Paper, August 1977), p. 24.
 5. Street beautification/landscaping associated with BART also occurred on Mission Street (San Francisco), Shattuck Avenue (Berkeley) and Nevin (Richmond), but these projects were less extensive and less disruptive than the Market Street activities. For a more complete description of these projects, see Gruen Associates, Inc., Indirect Environmental Impacts, draft report (Berkeley: BART Impact Program, Technical Memorandum, January 1977).
 6. John Fendel, director of BART construction, personal communication.
 7. DeLeuw, Cather & Company, Responses of Nearby Residents to BART's Environmental Impacts (Berkeley: BART Impact Program Environment Project Technical Memorandum, January 1977), p. 66.

2. RESEARCH QUESTIONS AND STUDY APPROACH

OBJECTIVES

BART's construction activity was generally acknowledged to have disrupted normal business activities and circulation patterns in its vicinity. The objectives of this study were to analyze the manner in which BART construction affected retail sales and real property near the construction sites. We have examined the magnitude of the impacts, their distribution, the types of businesses most affected, and whether effects on minority areas differed from effects elsewhere.

The disturbance to street and pedestrian traffic that BART construction was known to have caused may have impeded access to nearby retail stores. The construction activities also produced environmental disamenities such as noise and dust, and for various periods deteriorated the aesthetics of the immediate area. We felt that these conditions, generally non-conducive to retail business, might have caused a slump in retail sales activity. The first hypothesis we studied, therefore, was:

HYPOTHESIS 1: During BART's construction period, retail sales and services businesses near BART lost sales that otherwise would have been made.

Stated more explicitly, four operational hypotheses emerged from Hypothesis 1:

Hypothesis 1-A: Retailers near the BART construction sites felt that the construction activities had caused their sales to decline during that period.

Hypothesis 1-B: Receipts of stores near BART declined during the construction period, while those of stores located farther from the construction activities did not.

Hypothesis 1-C: Small stores were more seriously affected by BART construction than were large establishments.

Hypothesis 1-D: Stores serving minority and low-income areas were more seriously affected than were other stores.

We also thought that the disruptive factors associated with the construction might have discouraged nearby property owners from maintaining or rehabilitating their buildings, or from proceeding with new construction. Specifically, property owners may have perceived BART's construction processes to directly interfere with their own repair or construction work. The state of visual disarray produced by BART may also have deterred property owners from improving their buildings until the aesthetics of the area had been restored. Our hypothesis was:

HYPOTHESIS 2: During BART's construction period, property owners and builders deferred or eliminated maintenance, rehabilitation, and new construction near BART.

Once again, three more explicit hypotheses were actually studied:

Hypothesis 2-A: Property owners and builders perceived BART's construction activities as impediments to maintaining, rehabilitation, or building on their properties.

Hypothesis 2-B: The amount of construction activity on properties close to BART declined during the period when BART construction was occurring.

Hypothesis 2-C: The decline was more severe in minority areas than in other areas.

A related issue examined was the extent to which BART's construction caused damage to nearby properties.

METHODOLOGY

Key informant interviews contributed the bulk of the information needed to evaluate Hypotheses 1-A and 2-A. For retailers' impressions of BART's construction effects on their sales (Hypothesis 1-A), the interviews from Study of Retail Sales and Services⁸ were particularly informative. Most interviews were with merchants whose stores were within one block of BART construction. In addition, several comments from the interviews conducted for Study of the Office Construction Industry⁹ also pertained. To augment these data, and to test the reliability of the informants' retrospective observations, sources contemporary with the construction period were studied. Newspaper accounts, BART complaint files, and descriptions of lawsuits filed or threatened against BART provided information for Hypothesis 1-A. Responses to earlier surveys gave insight into consumers' views of construction impacts on retail businesses.

BART's effects on retail sales were examined in the above-mentioned study of retail sales and services. From 1970 through 1976, sales tax data were compiled for a sample of stores in the BART service area.¹⁰ The San Francisco, Oakland,

8. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of Retail Sales and Services (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, April 1978).

9. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Office Construction Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977).

10. Louis P. Bucklin, BART-II, Part IV, Impact on Retail Sales, IURD, U.C. Berkeley, June 1973.

and Berkeley samples were reaggregated according to distance from BART, and we compared the construction and post-construction sales trends of stores near BART to those farther away (Hypothesis 1-B). Large stores, stores with annual sales exceeding \$500,000 (N = 83), constitute the bulk of the sales in each area. They were divided into those stores within 400 feet of a BART station, and those more distant. Smaller stores (N = 203) were divided into those within 300 feet (about one city block) of a station, and those more distant.¹¹ Because other studies had found BART construction impacts primarily within one block of the sites of activity, we chose 300 feet as the cutoff point for small stores near BART. We had to extend the distance to 400 feet for large stores in order to insure that there would be enough stores in each set to maintain confidentiality. To detect differential impacts (Hypothesis 1-C) the small- and large-store groups were analyzed separately. Information on how stores located in ethnic minority and low-income areas were affected by BART's construction activities (Hypothesis 1-D) was obtained from key informant interviews in conjunction with the sales trend data, and previous studies identifying the locations of minority group concentrations and low-income areas in the BART service area.

Hypothesis 2-A, relating to property owners' opinions of BART construction activities' effects on maintenance, rehabilitation, and new construction, was studied from the key informant interviews noted above and from interviews conducted for Study of the Housing Industry.¹² To investigate Hypothesis 2-B, building permit data previously gathered for Study of the Office Construction Industry¹³ were reaggregated by distance to BART and by type of permit. We analyzed trends in the number of annual permits granted for construction over \$1,000 from 1960 to April 1977, for properties within 150 feet (approximately one-half block) of BART. Permits for new construction were viewed separately from permits for maintenance or rehabilitation. The trends were examined for signs of decline coinciding with BART construction. Whether the effects were more striking in minority areas was found by comparing the construction trends in minority areas with trends elsewhere.

LIMITATIONS OF THE ANALYSIS

The data analysis techniques used in this study show whether declines in sales or construction coincided with the periods of BART construction activity. Causation can only be inferred from interviews with knowledgeable individuals, and eludes positive proof. Except in one instance, neither the analysis of building permits nor that of the sales tax data effectively isolates the effect of BART from other influences that may have occurred at the same time. We compared

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11. Distance from the station, rather than the line, was used due to its relevance for the Study of Retail Sales and Services, *supra*, footnote 8.
 12. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Housing Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, September 1977).
 13. *Idem*, Study of the Office Construction Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977).

these data analyses with the opinions of key informants, with contemporary files and documents, and with earlier surveys, and to the extent that these sources support or contradict the other analyses, the findings can be accorded varying degrees of confidence. Such conclusions cannot, of course, be subjected to statistical tests of significance.

While key informant interviews enabled us to trace BART construction's role in business declines and in decisions to maintain, rehabilitate, or embark upon new construction near BART, the interview technique itself has limitations. Retrospective questions are subject to distortion from poor memory and from the influence of outside sources (especially both positive and negative publicity given BART). In addition, the relative infrequency of substantial building modifications made it difficult for most informants to determine whether BART's construction had any effect. Because of these limitations, the key informant interviews were considered with information from several other sources, including contemporary documents, litigation files, and retail sales and building permit data.

The data used to ascertain BART's possible effects on retail sales during the construction period have some drawbacks.¹⁴ Sales tax data collection did not begin until 1970, well after much of BART's heavy construction was initiated. Other information from the pre-BART construction period (from the U.S. Census of Business and Manufacturers, 1963 and 1967) cannot be stated in terms of distance to BART. Therefore, our analysis was limited to a during-construction/post-construction comparison of sales for stores near BART, and a near-BART/distant-from-BART comparison of sales during construction. Even so, the data representing the during-construction phase pertain only to the period after January 1, 1970.

The primary limitation to the analyses of permits for office construction and rehabilitation is that the best available data are incomplete for several areas. By studying the trends in terms of permits per year we minimized the problem of underestimating building activity in areas where data were missing for some years. Nevertheless, missing data require us to present an incomplete picture of the total permit activity in the near-BART area.

Finally, the only available data on building permits for residential construction in BART's service area are aggregated by city or groups of cities. This severely limits our ability to detect any impacts construction may have had near BART. Unless BART's construction had a very large or area-wide effect, near-BART impacts would likely be overshadowed by trends in the rest of the area.

14. Limitations of the sales tax sample are also discussed in John Blayney Associates/David M. Dornbusch & Company, Inc., Study of Retail Sales and Services (Berkeley: BART Impact Program Land Use and Urban Development Working Paper, April 1978).

3. BART'S CONSTRUCTION EFFECTS ON RETAIL SALES

Hypothesis 1-A: Retailers near the BART construction sites felt that the construction activities had caused their sales to decline during that period.

Key informant interviews, contemporary documents, and litigation against BART support Hypothesis 1-A. While not every retail or service business was detrimentally affected, many were, according to their managers.

1. Evidence from Key Informant Interviews

The following paragraphs summarize findings from interviews conducted for the Study of Retail Sales and Services¹⁵ and Study of the Office Construction Industry,¹⁶ that pertain to BART construction's impacts on retail sales. The symbols in parentheses refer to the informant who provided the information and whose name, organization, and area of discussion are given in Appendix A.

Downtown Oakland:

According to our interviews, retail business decreased noticeably during BART construction, but concurrent redevelopment activities probably contributed to the decline. A representative of a large retail store less than a block from BART felt that his sales had decreased during the construction (A-12). He also stated that the volume of people coming into the store decreased during that period. Declines in patronage and receipts were also noticed by three banks/savings and loan institutions located within one block of BART (A-13, A-14, A-15). Although one cited redevelopment as the cause, all three remarked that retailers experienced losses during that time. There was also some change in clientele; one informant thought that BART construction had driven away the more affluent customers in his San Francisco and Oakland locations, while another observed "overall" changes in clientele which he attributed to redevelopment.

A representative of a minority citizen's group stated that business declined in the downtown concurrently with BART construction, but he could not be certain that the decline was caused by BART construction because sales had been decreasing previously (A-10). A member of Oakland's Department of Community Development stated that during BART construction pedestrian traffic along the business corridor was disrupted, causing merchants' profits to fall (A-11). Some businesses closed, but he felt that they were marginal and the decreased patronage caused by BART construction "pushed them over the edge."

15. Ibid.

16. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Office Construction Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977).

San Francisco - Mission District:

Of the retail areas studied, interviews from the Mission District present some of the most consistent evidence of adverse impacts on retail sales during BART's construction. One of the five merchants interviewed was located six blocks from the construction activity and was unaffected by it (A-5). But the other four (A-6 through A-9) were all located on Mission Street and all experienced lowered sales during BART's construction. Two businesses, Sears and a large furniture store, moved from the area in 1975. Both stores had been in business on Mission Street for more than 45 years. Sears' sales, however, had already been declining before BART construction began. Two merchants dismissed employees and three noticed a decrease in the volume of people coming to their stores during the construction period. One merchant said that his clientele changed toward more low-income and minority individuals.

Five persons were interviewed who were not merchants but who were familiar with the Mission District business community (A-1, A-2, A-3, A-4, A-28). All agreed that the economy of the area suffered during BART's construction, and four of the five attributed the decline to BART. Many small businesses were said to have been seriously affected. In the 16th Street station area, BART's construction effects probably intensified negative influences that had been affecting business there prior to BART.

San Francisco - Downtown:

Representatives of three major department stores in downtown San Francisco were interviewed (A-23, A-24, A-25). Macy's Union Square store, located about two blocks from BART, extended its hours of operation and hired more employees during this period, and was apparently unaffected by the construction. The other stores, Woolworth's and the Emporium, adjoin the Powell Street station and both had special entrances to BART constructed. During the construction period both of these stores experienced level or lowered sales. In Woolworth's the volume of people passing through the store also declined.¹⁷

A downtown savings and loan institution and a bank also experienced declines in patronage during BART's construction (A-13, A-14). One informant attributed this to impaired access from Market Street caused by BART.

Downtown Berkeley:

Representatives of two large retail stores, one adjoining BART and the other within one block of the station, were interviewed. Neither found BART construction to have affected their businesses (A-16, A-17). One stated that the construction was only an inconvenience, and the other remarked that BART management had tried to minimize the impacts of construction. A Chamber of Commerce spokesman, however, complained that although BART had been "sold"

17. One may speculate that one store's apparent increase in business during this period may partially reflect a gain of customers lost by other BART-affected stores.

to the business community on the premise it would stimulate business, construction had disrupted the city's downtown for three Christmas seasons (A-18).¹⁸

In Other Areas:

A representative of the sole retail store within one block of the Walnut Creek BART station, Cost Plus, stated that BART construction in no way affected his sales or operations. As might be expected, a major retail store located one-quarter mile from the BART station in Fremont was entirely unaffected by BART's construction (A-20). Informants told us that BART construction had no impact on sales or operations in the Bay Fair Shopping Center (A-21, A-22) despite its proximity to the Bay Fair station. In Richmond, the decline in patronage of a large store was ascribed to the general decline in business accompanying redevelopment in that community, and not to BART construction (A-23).

Summarizing all the interviews, about half of the fifteen merchants responding to the question indicated that their sales had declined during the period when BART was being constructed. Of those who noticed a decline in sales, only half identified BART construction activities as the reason for the drop. In some cases their sales had been declining before construction began. In others, redevelopment activities were cited as contributing to or causing the decline in sales.

Of related interest are responses of Bay Area residents to selected questions on three separate surveys. In 1971, the Bay Area Survey #1 sampled residents in the entire San Francisco-Oakland SMSA.¹⁹ Nearly 80 percent of the respondents resided inside BART's service area. When asked if BART's construction had changed their neighborhoods, 12.4 percent noted some change: of these, 6.8 percent remarked that construction activities or delays had harmed local businesses. In the 1972 Travelers Study,²⁰ 11.6 percent of the nearly 500 persons sampled stated that their business or the business of someone they knew had been upset by BART construction, and 35.2 percent said that it caused inconven-

18. Robert Pitts, of Human Resources Corporation, added the following information regarding retail sales in Berkeley: "With respect to downtown Berkeley, there is little evidence to show that any trend in sales data could be attributed to the period of construction of BART. In considering this trend of sales, the impact of the student body at the University of California must be taken into consideration. Historically, there has been reported evidence of declining sales in downtown Berkeley due to this dominant population. This trend preceded construction of BART and had probably stabilized during the period of construction. In those areas of Berkeley where the tracks were constructed, outside of downtown Berkeley, they are elevated and little interruption of business probably occurred due to the fact that the tracks did not traverse the main arteries of such activities." (Robert Pitts, memo of April 20, 1978.)

19. Survey Research Center, "Bay Area Survey #1" (Berkeley: University of California, Berkeley, 1972). (Computer Printout)

20. *Idem*, "Travelers Study" (Berkeley: University of California, Berkeley, Spring 1972). (Computer Printout)

ience in their travel. Finally, in a survey conducted for the Urban Residential Environment Study (URES),²¹ 16.1 percent of the persons living within one mile of a BART station and who were subjected to construction impacts indicated that BART construction had made getting to stores or school more difficult for them. These results indicate that some consumers (albeit a relatively small proportion) felt that certain businesses had been detrimentally affected by BART construction. The difficulty in traveling to stores (and schools) expressed by several URES respondents may have led them to shift their shopping patterns away from BART construction areas, but this was not addressed in the survey.

2. Evidence from Contemporary Documents

Losses of sales were attributed to BART construction also in newspaper accounts and other records of events during that period. Market Street in downtown San Francisco received the most attention, as shown by the following examples:

- In April, 1968, more than one dozen merchants whose businesses were located on Market Street between Sansome and New Montgomery complained to the Board of Supervisors that their sales had fallen considerably since the onset of BART construction. They contended that their stores were hidden behind barricades, that the sidewalks were narrowed to such a degree that it was difficult to pass, and that pedestrian traffic had been reduced by 50 percent. They requested lower barricades, more transit stops, new pedestrian crossings or temporary tax relief.²²
- In September, 1969, many small businessmen on Market Street were experiencing declining sales, which they attributed to loss of access and of parking, decreased visibility, and noise and dust generated by BART construction.²³
- The owners of small businesses along Market Street continued to denounce BART (and later the associated street beautification) construction activities for lowering their sales and hampering day-to-day operations such as making deliveries. By 1970, some store closures had occurred that were attributed, at least in part, to disruption caused by BART construction. Many businesses had experienced a 40 percent reduction in sales since construction began.²⁴ Merchants in small stores on Market Street between 6th and 7th Streets instituted a leafleting campaign opposing the fences and obstructions

21. "Analysis of URES Data" (computer printout file), March 1975, pertaining to Urban Residential Environment Study.

22. "Market Street Merchants Seek BART Relief," San Francisco Chronicle, April 18, 1968.

23. File records of Miriam Hawley, BART Impact Study Coordinator, Bay Area Rapid Transit District.

24. "BART Chaos Hurts Firms," San Francisco Chronicle, October 26, 1970.

associated with construction activities and denouncing the Market Street Development Project. Their complaints continued into 1972.

There also appeared some accounts that seem to contradict the claims of negative effects:

- An article in the San Francisco Examiner (August 11, 1968) stated that the large decline in the downtown's retail sales that had been predicted had not materialized, and that business was at least as good as in pre-construction days.
- Paul Ryan, manager of the San Francisco Board of Trade, acknowledged in late 1968 that business along the BART line was depressed, especially near the sites of major underground work. But he claimed there had been fewer closings during the past year than in previous years. Higher interest rates were cited as a potentially greater cause for the depressed retail activity than BART construction.²⁵
- In October, 1969, Wayne Reinholt of the San Francisco Retail Dry Goods Association stated at a press conference that business had been improving on Market Street during the previous year. The Association reports the sales of eleven major stores in downtown San Francisco.
- At a public information meeting of BART, a diamond merchant on Market Street claimed that BART construction activity had improved his business 20 to 25 percent over the previous three years.²⁶
- Despite extensive BART construction adjacent to the store, Woolworth's in downtown San Francisco continued in 1972 to have the greatest volume of sales of any Woolworth's store in the nation.²⁷

A number of factors might account for the apparent discrepancy evidenced above. It is possible that both views are correct, but that large stores were less affected by construction than were small stores. Key informant interviews (for example, A-26 and A-27) support this observation; sales tax data, however, do not (see Hypothesis 1-C). Still other reasons could have caused differential impacts; for example, one would expect that stores relying heavily on impulse buying and foot traffic would suffer more than other merchants. Thus, establishments primarily serving other businesses, providing unusual services, or selling unique or expensive merchandise might have been less affected by BART construction's disruption of travel patterns. On the other hand, marginal businesses would be particularly sensitive to losses in trade, and unable to survive a period

25. File records of Miriam Hawley.

26. Ibid. In a follow-up interview the store's manager attributed the sales increase to more diligent efforts and better performance on behalf of the store's employees in their attempt to counteract the negative effect that BART construction was otherwise bound to have had.

27. "The Merchant Has His Reward," San Francisco Chronicle, July 19, 1972.

of depressed sales. Another possible explanation is that the news articles proclaiming increasing sales were purposely written to generate an atmosphere of well-being, and by presenting a positive image of the downtown, allay fears that might have inhibited customers from visiting the area.

3. Litigation Against BART

Several suits were filed against BART, claiming that impairment of access caused by BART's construction had caused sales revenues to decline. Typically, compensation has not been awarded for the inconvenience of decreased access imposed by BART construction. A brief outline of the relevant cases follows.

In Lachman Bros. v. BART, the plaintiff claimed physical damages and that BART construction on Mission Street in San Francisco limited access to the store and caused it to lose business. The store has since gone out of business, and the claim was settled (for \$10,000) out of court.

The operator of a service station next to the BART line in southern Oakland claimed that the construction forced him to relocate and rebuild much of the station, and in doing so interfered with access to the station and with traffic patterns on the surrounding streets, combining to hurt his business. The action was settled by BART's insurance company.

The Orpheum Building Company's suit against BART was based on the allegation that the Orpheum Theater's loss of revenues was attributable to construction of the adjacent Civic Center station in San Francisco. The plaintiffs claimed that pedestrian access was limited by numerous construction activities: narrowing the sidewalks, erecting barriers, repeated tearing-up of sidewalk and crosswalk areas, temporary closing of crosswalks, closing the streets to through traffic, eliminating loading and unloading zones, and eliminating curbside parking, among others. View impairment was also mentioned as inhibiting advertising and display essential for attracting customers, and that excessive noise disturbed the theater's operations. Support of the theater's position came from the facts that construction occurred around three sides of the building, and that the construction was prolonged more than a year beyond the planned completion date. Orpheum presented evidence that other nearby theaters that were not next to BART station construction continued to reap increased profits at the same time the Orpheum's business was declining. BART argued that the theater had in fact made profits during the period and that the value of the property had increased. In the end, Orpheum's claims were rejected, and no damages were awarded. Although access had been temporarily limited by the construction activities, the court found that there was no taking or damaging of the property. The jury's verdict held that Orpheum had suffered neither temporary nor permanent damages, and that the property had actually benefited in excess of \$100,000 from the construction of the public project. The case is currently on appeal, but only for reimbursement of attorney's expenses.

Finally, a Market Street flower stand operator complained that he was ordered to close his stand temporarily due to BART construction, and that in addition, the disruptive influence of the construction activities was depressing his business. Because the operator had no property interest in Market Street, however, it appears that his complaint was not supportable.

In two other cases, BART was sued although the construction in question was for the San Francisco Municipal Railway line rather than for the BART line. In *Gustavson, et al. v. BART*, the owner of a motel about one block from underground line construction in downtown San Francisco filed for damages on the grounds that the construction had impaired access to his property, hurt his business, and caused physical damage. In preliminary hearings the court found that the decreased access claim was unjustified, and the jury made no damage award.²⁸ And, a stereo store on Market Street threatened to, but did not, sue BART because the disturbance of construction had forced it to move to another location. Specific complaints were that access was disrupted and that noise from the construction activities prevented customers from adequately hearing the store's products.

In summary, all of the suits filed against BART have been settled in BART's favor in regard to alleged financial damages (loss of sales) suffered as a result of the disruption caused by BART's construction activities. Such damages are noncompensable when attributable to reasonable actions of a public agency that cause temporary inconvenience or disturbance to private individuals or businesses. Clearly, however, BART's negative effects on retail sales described elsewhere in this section stand independent of the outcome of the above lawsuits.

The three types of information reviewed here (key informant interviews, contemporary documents, and litigation) support the hypothesis that some merchants near BART construction sites felt that the construction activities had caused them to lose sales. Retailers' responses were by no means universal: some claimed that BART was destroying their businesses, others that it had little effect. In general, the information suggests the following observations:

- Retailers in suburban locations were rarely affected by construction activity, as compared to those near BART's underground construction activities in the cities. Merchants in those areas were much more likely to experience declining sales.
- In Richmond and Oakland it is difficult to isolate BART's effects from those of redevelopment, or to determine their degree of interaction.
- Impaired access was the factor most commonly perceived by retailers as the cause of declining sales associated with BART construction. Both pedestrian and vehicular access constraints were cited. Loss of signs or of window displays was deplored much less often, and the temporary environmental degradation associated with construction was cited as a cause of lost sales even less frequently.

Hypothesis 1-B: Receipts of stores near BART declined during the construction period, while those of stores located farther from the construction activities did not.

Sales tax data sampled for retail stores in the downtowns of San Francisco, Oak-

28. The case is currently on appeal for restitution of attorney's fees.

land, and Berkeley did not clearly support this hypothesis. In all three areas large stores within 400 feet of a BART station²⁹ were found to have experienced declines during BART construction, but so had the more distant stores. (See Table 2.) Although the construction period declines of the near-BART stores were greater than those of the other stores, their post-construction declines were also greater. Because comparable data prior to 1970 are unavailable, one is unable to establish whether the figures indicate overall (1) that the near-BART stores were less prosperous than the others even before BART construction began, or (2) that BART's construction depressed the business of the near-BART stores, and they had not fully recovered from the decline by 1976.

TABLE 2. AVERAGE ANNUAL REAL GROWTH IN TAXABLE RETAIL SALES PER STORE BY DISTANCE FROM BART--LARGE STORES

	<u>All Stores</u>	<u>Within 400 Feet of BART Station</u>		<u>More Than 400 Feet From BART Station</u>	
	<u>Pre-Con- struction^a</u>	<u>During Con- struction^b</u>	<u>Post-Con- struction^c</u>	<u>During Con- struction^b</u>	<u>Post-Con- struction^c</u>
SAN FRANCISCO	-0.5	-3.9	-2.4	-2.7	3.0
OAKLAND	-2.9	-7.8	-2.9	-2.6	-2.9
BERKELEY	1.7	-4.6	-1.7	1.3	3.1

SOURCE: Sales tax data collected by the California Board of Equalization for sample stores in the BART service area.

- a. 1963 - 1967. Figures apply to entire CBD and are not necessarily comparable to the sales tax figures. U.S. Census of Business and Manufacturers, Major Retail Centers, California, 1963 and 1967.
- b. 1970 - 1972 for downtown San Francisco; 1970 - 1971 for downtown Oakland and Berkeley.
- c. 1972 - 1976 for downtown San Francisco; 1971 - 1976 for downtown Oakland and Berkeley.

29. One city block is approximately 300 feet. The smallest distance we could use and still maintain confidentiality of the large stores was 400 feet. Because the sales of the large stores constitute the bulk of the sales in each location, they are used here to indicate the overall sales trends in the areas studied. Small stores are examined separately in the next section.

Annual sales reports by the City of Berkeley shed light on two areas. Figures are compiled for the central business district, which surrounds the Berkeley BART station, and for the "Adeline-Alcatraz" area, adjoining the Ashby station and overlying underground BART track.

In the Ashby station area, the figures show evidence of a BART-induced decline and lack of recovery. Construction in the area began in late 1968. The major part of the construction was finished by mid-1971, but the station was not completed until late 1972. During this period, sales in the station area decreased markedly, as shown by **Table 3** (on the following page). A report from the Berkeley Planning Department stated that the neighborhood's streets had been torn up through most of 1971 and this had produced a negative effect on the businesses there.³⁰ The number of retail and service establishments fell during BART construction,³¹ and neither taxable sales nor the number of establishments have regained their former levels. An informant observed that most of the retail stores affected served the black community and were largely black-owned. Many of the stores that closed were small, marginal enterprises. It appears now that intervention by the City will be required to restore economic activity in this area (A-29).

In contrast, Berkeley's central business district shows a more-or-less continual downward trend since 1965. The heaviest construction in downtown Berkeley took place from late 1966 through 1968, and the station was finished in 1972. The figures in **Table 4** (on the following page) show that sales declined during this construction period, but that the trend had existed even before BART construction. Furthermore, key informants indicated that BART construction impacts on sales were minor in downtown Berkeley.

Returning to the sales trends shown in Table 2, one finds that the stores nearer BART stations showed diminishing declines after most construction had ended, as did stores farther from the stations. This might indicate that shoppers who had ceased to patronize the three downtown areas before or during BART construction had begun to return. Indeed, this explanation is consistent with findings of the Study of Retail Sales and Services, that BART appears to be having some intra-regional effect on shopping locations, especially in downtown San Francisco and Oakland.³²

30. City of Berkeley, Comprehensive Planning Department, Berkeley Retail Sales, 1971.

31. Idem, "Business License Changes," published annually for the Adeline-Alcatraz area.

32. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of Retail Sales and Services (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, April 1978). The study also found that, according to sales data, proximity to BART could not be said to have been a positive factor in retail sales from 1970 to 1976. If anything, the overall effect of proximity in the central business districts appears to have been a negative one, perhaps reflecting construction-related declines.

TABLE 3. TAXABLE RETAIL SALES IN THE ASHBY STATION AREA

	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
SALES, IN CURRENT DOLLARS (1,000s)	1,051	1,282	1,507	--	1,207	1,014	930	888	1,043	1,037	996	978
SALES, IN 1967 DOLLARS (1,000s)	1,112	1,310	1,507	--	1,100	872	767	708	785	703	618	574

SOURCE: City of Berkeley, Comprehensive Planning Department, Berkeley Retail Sales, published annually.
Data for 1968 not available.

TABLE 4. TAXABLE RETAIL SALES IN BERKELEY'S CENTRAL BUSINESS DISTRICT

	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
SALES, IN CURRENT DOLLARS (1,000s)	36,140	35,859	35,824	--	39,302	38,604	38,746	38,584	42,446	45,014	47,379	50,476
SALES, IN 1967 DOLLARS (1,000s)	38,236	36,647	35,824	--	35,804	33,199	31,965	30,790	31,918	30,519	29,375	29,629

SOURCE: City of Berkeley, Comprehensive Planning Department, Berkeley Retail Sales, published annually. Data
for 1968 not available.

Hypothesis 1-C: Small stores were more seriously affected by declining sales attributable to BART construction than were large establishments.

This hypothesis was not supported by sales tax data for sampled stores with less than \$500,000 in annual sales in the downtown areas of San Francisco, Oakland, and Berkeley. When compared with annual sales trends for large stores near BART stations, the smaller stores near BART showed less of a decline during the construction period. This was true for all three downtowns.

Table 5 (on the following page) presents the growth rates for small stores. During BART construction in both San Francisco and Oakland, the average growth in sales for small stores near BART stations was actually greater than for small stores farther away.³³ None of the small store sets near BART exhibited the expected trend of increasing sales (or decelerating decreases in sales) after BART's construction period.

Hypothesis 1-D: Stores serving minority and low-income areas were more seriously affected by BART's construction activities than were other stores.

As stated earlier, the heaviest construction occurred where underground stations were built in downtown San Francisco, the Mission District, Oakland and Berkeley, and for subway line segments in the Mission District and throughout much of Oakland. Except for downtown Berkeley, these areas are populated largely by minority or mixed ethnic groups.

Key informant interviews lend support to Hypothesis 1-D. Declining sales near BART construction were most consistently noted in the Mission District in San Francisco, where most residents are of Spanish heritage and median incomes are substantially below the regional average,³⁴ and in downtown Oakland, which adjoins concentrations of black and Asian populations and where incomes are lower than average.³⁵ Regarding these areas, eight of the nine people questioned stated that sales had declined during BART's construction. The effects in downtown San Francisco, which serves a mixture of ethnic and income groups, were less clear. Newspaper accounts from the period reported several complaints from Market Street merchants regarding sales lost due to BART construction, and most of the lawsuits claiming financial injury were from downtown San Fran-

33. A possible explanation could be that closeouts of marginal stores raised the overall sales-per-store average.

34. Gruen Associates and DeLeuw, Cather & Company, Environmental Impacts of BART - Final Report, Report No. DOT-BIP-FR-7-4-77 (Springfield, Virginia: National Technical Information Service, August 1977), pp. III-12, 13.

35. Association of Bay Area Governments, "1970 Census Tract Profiles" (San Francisco: ABAG, n.d.). (Mimeo) A large area east of downtown Oakland, however, is occupied primarily by whites. (Robert Pitts, Human Resources Corporation, memo of April 20, 1978.)

TABLE 5. AVERAGE ANNUAL REAL GROWTH IN TAXABLE RETAIL SALES PER STORE BY DISTANCE FROM BART--SMALL STORES

	<u>All Stores</u>	<u>Within 300 Feet of BART Station</u>		<u>Beyond 300 Feet of BART Station</u>	
	<u>Pre-Con- struction^a</u>	<u>During Con- struction^b</u>	<u>Post-Con- struction^c</u>	<u>During Con- struction^b</u>	<u>Post-Con- struction^c</u>
SAN FRANCISCO	-0.5	-2.7	-5.5	-4.3	-3.2
OAKLAND	-2.9	9.1	-6.0	-4.3	-2.7
BERKELEY	1.7	1.6	-5.3	11.7	-1.81

SOURCE: Sales tax data collected by the California Board of Equalization for sample stores in the BART service area.

- a. 1963 - 1967. Figures apply to entire CBD and are not necessarily comparable to the sales tax figures. U.S.Census of Business and Manufacturers, Major Retail Centers, California, 1963 and 1967.
- b. 1970 - 1972 for downtown San Francisco; 1970 - 1971 for downtown Oakland and Berkeley.
- c. 1972 - 1976 for downtown San Francisco; 1971 - 1976 for downtown Oakland and Berkeley.

cisco. On the other hand, our limited number of key informant interviews did not suggest a large impact on sales. In contrast, key informants in downtown Berkeley (a predominately white, moderate-income area) gave no specific incidences of declining sales.

The three downtowns for which sales tax data were analyzed (San Francisco, Oakland, and Berkeley) differ in ethnic composition as noted above. Of the three areas, Oakland evidenced the greatest decline in sales during the BART construction period (see Table 2). The decline, however, cannot conclusively be attributed to BART, especially since redevelopment activities occurred in the area concurrently. Sales data in the Ashby station vicinity (Table 3) support subjective observations that BART's construction severely affected this primarily black area.

4. BART'S CONSTRUCTION EFFECTS ON PROPERTY

MAINTENANCE, REHABILITATION AND NEW CONSTRUCTION

Hypothesis 2-A: Property owners and builders perceived BART's construction activities as impediments to maintaining, rehabilitating, or building their properties.

Key informant interviews lent no support to this hypothesis. Regarding office construction, rehabilitation and maintenance, none of the employers interviewed for the Study of Employers' Locational Decisions³⁶ claimed that BART construction had in any way deterred new construction of offices or businesses. In direct opposition to Hypothesis 2-A, we found that BART construction may have actually encouraged some office development. It appears that in downtown San Francisco, until ground was broken, many developers remained skeptical of BART and were reluctant to commit themselves to new projects (B-2, B-3, B-4). The initiation of streetwork verified a long-term commitment to rapid transit in the central city. In this regard, the initiation of BART's construction appears to have stimulated development somewhat.³⁷ (Indeed, a slight increase in building permits granted for new office construction in downtown San Francisco between 1967 and 1972 is evident from Table 7, to follow.)

Similarly, builders in the housing industry offered no evidence that the disruption caused by BART construction caused them to delay or eliminate new housing construction. Three of 25 developers interviewed for the Study of the Housing Industry³⁸ indicated that the timing of their projects had been influenced by BART's construction (B-5, B-6, B-7), but it was the ending of BART construction, or the initiation of BART service, that was the principal concern. When asked whether developers had misgauged the start of BART service due to the unanticipated delays in construction, most responded that they had not. One instance, the Diablo Keys apartment complex in Walnut Creek, was cited as an exception (B-5, B-8, B-9). There, misjudgment of both the timing of initial BART service and BART's relatively minor impact on housing demand contributed to high vacancy rates and financial hardship for the developer. Thus, the primary effect of BART's construction activities on new housing construction appears to have

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36. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of Employers' Locational Decisions (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977).
 37. The Pacific Gas and Electric Company's high-rise office building on Beale Street in San Francisco, within one block of BART's Embarcadero Station, was cited as an example of a major office building built during BART construction. P.G.&E.'s decision to build at that particular time was not influenced by BART construction (B-1).
 38. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Housing Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, September 1977).

been indirect, in that developers expected the end of construction to coincide with initiation of BART service, and some sought to time their projects to coincide with the new transit service. This fact implies that any temporary, negative factors developers might have associated with BART's construction were outweighed by the advantages of timing their developments to open at the start of BART service.

The long-term adverse environmental effects of BART (primarily noise) on potential new housing developments appeared to greatly overshadow any temporary construction impacts. The Study of the Housing Industry found four developers whose decisions were influenced by BART's potential noise impacts. But no developer interviewed offered that the adverse environmental impacts accompanying BART's construction activities in any way deterred them from undertaking a new development.

The study concluded that rehabilitation in the Fruitvale, Richmond, and Mission District BART station areas has not been significantly affected by BART-related disincentives, nor by BART-related inducements. Its conclusions, however, are based on data from 1975 and 1976 and therefore do not necessarily represent occurrences during BART's construction.

Although the interviews do not include every firm or developer potentially affected by BART construction, they include most of the major developers and a large number of the firms most likely to have been influenced. Moreover, the consistency of the responses allows one to generalize with a fair degree of confidence that property owners and builders did not perceive BART's construction activities as obstacles to development or reconstruction. There does appear to have been some indirect effect on the timing of new office and housing construction. In San Francisco, BART's groundbreaking was interpreted as a permanent commitment to BART and to the Market Street area, and may have spurred new construction slightly by lessening the uncertainty of the profitability of new development there. In housing, three developers indicated that the timing of their projects had been influenced by the timing of BART construction. These findings, however, are incidental to the primary concern of Hypothesis 2-A, i.e., that the disruption caused by BART's construction was viewed by property owners and builders as impediments to their own construction activities.

Hypothesis 2-B: The number of building permit applications for properties close to BART declined during the period of construction activity.

We examined permits for new office construction and for additions or alterations to existing offices, which were granted for properties within 150 feet of the entire BART line and station areas. Tabulations of the numbers of permits are given in **Tables 6 and 7**. Only permits for \$1,000 or more were recorded in order to eliminate very minor work (virtually all the permits exceeded this value). The construction periods indicated correspond to the timing of most major BART construction for the area.

The data on office alterations and additions in Table 3 do not exhibit a declining trend during BART's construction. In fact, in the one area (Richmond through Albany) where the average number of permits per year declined during BART construction, the number of observations was so small as to preclude inferences

TABLE 6. PERMITS FOR ADDITIONS AND ALTERATIONS TO OFFICES

Area	BART Construc- tion Period	NUMBER OF PERMITS (WITHIN 150 FEET OF BART) ^a		
		Pre- Construc- tion	During Construc- tion	Post- Construc- tion
RICHMOND through ALBANY	1966-1972	1(6)	0(7)	1(4.25)
BERKELEY	1967-1971	6(5)	7(5)	8(5.25)
CONCORD to OAKLAND ^b	1966-1971	--	1(2)	64(5.25)
DOWNTOWN and WEST OAKLAND	1966-1971	6(6)	18(6)	16(5.25)
LAKE MERRITT to SAN LEANDRO	1966-1970	1(6)	0(5)	0(6.25)
SAN LEANDRO through FREMONT ^c	1969-1971	1(9)	3(3)	1(5.25)
DOWNTOWN SAN FRANCISCO	1967-1972	20(7)	22(6)	18(4.25)
MISSION DISTRICT ^d	1967-1971	0(7)	0(5)	3(5.25)

SOURCE: Building permit records for cities and counties in the BART service area. For detailed sources, see John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Office Construction Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977), pp. 42-54.

- a. Number in parenthesis indicates number of years for which information is available.
- b. Permits over \$100,000 only. All those shown occurred in Walnut Creek.
- c. Data are sporadic.
- d. No permits were recorded within 150 feet of BART's Daly City line past Wilder Street.

TABLE 7. PERMITS FOR NEW OFFICE CONSTRUCTION

Area	BART Construc- tion Period	NUMBER OF PERMITS (WITHIN 150 FEET OF BART) ^a		
		Pre- Construc- tion	During Construc- tion	Post- Construc- tion
RICHMOND through ALBANY	1966-1972	0(6)	3(7)	0(4.25)
BERKELEY	1967-1971	0(5)	3(5)	1(5.25)
CONCORD to OAKLAND ^b	1966-1971	0(6)	2(6)	1(5.25)
DOWNTOWN and WEST OAKLAND	1966-1971	5(6)	3(6)	6(5.25)
LAKE MERRITT to SAN LEANDRO	1966-1970	3(6)	2(5)	0(6.25)
SAN LEANDRO through FREMONT ^c	1969-1971	1(7)	0(3)	2(5.25)
DOWNTOWN SAN FRANCISCO	1967-1972	5(7)	8(6)	5(4.25)
MISSION DISTRICT ^d	1967-1971	1(7)	1(5)	2(5.25)

SOURCE: Building permit records for cities and counties in the BART service area.

- a. Number in parenthesis indicates number of years for which information is available.
- b. Permits over \$100,000 only. All those shown occurred in Walnut Creek.
- c. Data are sporadic.
- d. No permits were recorded within 150 feet of BART's Daly City line past Wilder Street.

about declining trends. Likewise, permits for new office construction did not decline during BART construction, except in two areas. In the San Leandro to Fremont section, the observations are too few to denote trends. However, the downtown-West Oakland area did have a definite drop in permits per year during BART construction—an average of .83 permits per year before, .50 during, and 1.14 after BART construction. We examined office building permits for the city as a whole to determine whether the decline was a city-wide phenomenon, or whether it might have been related to BART's construction activity. We found that in Oakland 87 permits had been issued pre-BART, during 1963 through 1965 (29 per year), 133 from 1966 through 1971 (22 per year) during BART construction, and 90 from 1972 through May, 1977, post construction (17 per year).³⁹ The city as a whole appears to be having a steady decline in new office construction. The temporary drop and then the subsequent increase in permit activity near the BART line obviously diverges from the city-wide trend, and may be due to BART construction. An alternative explanation is that the decrease was caused in part by redevelopment in the 12th Street station area, which began in 1969.

Building permit trends for housing construction have been analyzed for several communities along the BART line: Walnut Creek, Hayward, Union City-Fremont, and Daly City.⁴⁰ None of the BART communities' share of the permits for new single family housing construction issued in the Bay Area from 1962 to 1977 declined during 1967 - 1972, or roughly during BART's construction period. The share of permits for new multiple family housing declined during 1967 - 1972 in Daly City and in Hayward, but Hayward's share continued to fall and Daly City's remained at about the same level after 1972, implying no temporary, construction-related decreases. However, the data do not separate permits for construction near BART from all other housing construction in these communities, and thus would not be able to show BART's effect if the effect were small and confined to its immediate vicinity.

Hypothesis 2-C: The declines in building permits were more severe in minority areas than in other areas.

This study detected only one area where building permits noticeably declined during BART's construction. Permit activity for new office construction in the downtown-West Oakland areas near BART appears to have been subdued during the construction period. We were not able to attribute the decline to BART, however, and other areas along the BART line with large minority populations show no decline in permit activity.

39. Shirley A. Stephenson, Construction Trends Unit, Security Pacific National Bank, unpublished data (Los Angeles, July 1977).

40. John Blayney Associates/David M. Dornbusch & Company, Inc., Study of the Housing Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, September 1977); draft revisions and unpublished data, April 1978.

PROPERTY DAMAGE RELATED TO BART'S CONSTRUCTION

Evidence of property damage incurred by BART's construction is found in claims filed against BART contractors, in lawsuits undertaken against BART, and in BART's own complaint files.

A total of 3,332 damage claims have been filed against BART contractors, who in turn were insured by BART. As of 1977, BART's insurance had paid 9.6 million dollars in damages. Most of the claims were filed by utilities, although some were filed by one contractor against another. A smaller number were filed by individuals for damages to their property or person.⁴¹

Approximately 25 lawsuits involving elements of physical property damage caused by construction activities have been filed against BART. At least three of these, however, pertain to Municipal Railway line construction. Generally the types of damage cited were wall and ceiling cracks and structural harm caused by BART excavations. The only case which has yet been settled in favor of the plaintiff is Holtz v. Superior Court (3 Cal. 3d 296, 1970). The Court held:

. . . that adjacent property owners, whose buildings and other improvements settled and cracked when lateral support of their land was withdrawn because of excavation by public authorities for subway, would be entitled to compensation, under theory of inverse condemnation, for any actual physical injury to real property proximately caused by improvements as deliberately designed and constructed; public authorities were not entitled to protection afforded by statute setting out general mutual rights and duties of private coterminous owners with respect to lateral and subjacent support.⁴²

The case established that, unlike private parties, BART as a public agency was liable for damage to adjoining properties that was caused by the agency's excavations, even though no negligence was involved. The case was appealed to the California Supreme Court (17 Cal. 3d 648, 1976), but the verdict was not changed. The plaintiffs were awarded \$30,000 in the case, as well as interest and attorney and other fees totalling about \$16,000.

Throughout the construction period many householders and businesses complained

41. The foregoing information is from Marge Lane, BART Insurance Office, personal communication. The Office has not kept records of the number of claims by type.

42. Sup., 90 Cal. Repr. 345, p. 298.

to BART about damages from nearby construction activities.⁴³ Cracking plaster and stucco and damaged gardens and fences were frequent sources of complaints. Early in the construction period, in 1965 and 1966, such complaints were dealt with in an extremely prompt and personal manner. A representative of BART or of the contractor or both visited the complaint site, often on the same day, to provide for quick repair or relief. As time passed and complaints multiplied they were frequently turned over to the insurance investigator or referred to the contractor. Relief and repair were often effected rapidly, although in some instances complaints were repeated because relief was not prompt. By 1967 the experience of a number of invalid complaints had probably caused an attitude of caution to develop at BART. Investigation of several complaints of cracked plaster or weakened structures, for instance, showed that the condition had clearly existed before BART's construction activities had begun. Also, BART received complaints about many construction activities unrelated to BART, showing that people in the Bay Area often attributed all construction or repair activities during that period to BART. A perusal of the complaint files shows that in several instances the contractors made minor repairs in the interest of good community relationships, even though the problem was clearly not caused by BART construction.

43. The following information is adapted from Miriam Hawley, "BART's Construction Impacts As Seen Through BART Complaint Files" (Oakland: Bay Area Rapid Transit District, n.d.). (Mimeo)

5. CONCLUSIONS AND IMPLICATIONS

This study has found no negative effects on maintenance, rehabilitation or new construction that can clearly be attributed to BART's construction activities. On the other hand, BART construction evidently caused or contributed to declining sales in several areas. While other cities may not be able to avoid detriment to retail areas, they may be able to mitigate the adverse impacts by considering the following suggestions:

- Judiciously plan the locations of cut-and-cover construction. Obviously, considerations other than the temporary retail sales effects (i.e., engineering, and long-term land use requirements) will take precedence, but the fact that the greatest disruption has occurred in the vicinity of cut-and-cover construction should be acknowledged.
- Make a special effort to coordinate transit system construction with beautification projects—to preclude working at cross-purposes, to assess the joint impacts of the streetwork, and to minimize the period of disturbance.
- With the merchants themselves, create and execute plans to maintain an acceptable degree of access to their shops. The most common complaints arose from impaired pedestrian and vehicular access, and from difficulties in making deliveries. Early involvement of the merchants in attempts to devise alternate access routes (and possibly even construction schedules) may alleviate the problem to some extent. Participation by small-store proprietors should be encouraged.

Finally, several informants indicated that the sales of marginal businesses were most seriously affected by the construction. We also found, probably because of their proximity to the sites of cut-and-cover construction, stores serving low income and minority areas tended to be more adversely affected than other stores. Unless special reparations were contrived, however, there seems to have been no way these consequences could have been avoided.

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APPENDIX A. INTERVIEWS CITED—RETAIL SALES⁴⁴

1. Mr. Ben Ramos - Mission Economic Development Association - Mission District, San Francisco.
2. Architect/Contractor - Mission District, San Francisco.
3. Mr. Leandro P. Soto - OBECA/Arriba Juntos - Mission District, San Francisco.
4. Mr. Mackey G. Salazar - Attorney - Mission District, San Francisco.
5. Mr. George Rodriguez - Mi Rancho Market - Mission District, San Francisco.
6. Mr. Philo Holland - Sears - Mission District, San Francisco.
7. Ms. Josephine Tashjian - Si Tashjian Flowers and Gift Shop - Mission District, San Francisco.
8. Representative - Furniture Store - Mission District, San Francisco.
9. Mr. Matt Vasquez - Matt Vasquez Optical - Mission District, San Francisco.
10. Mr. Oscar Perez - Spanish Speaking Unity Council - Oakland.
11. Mr. Michael Kaplan - Oakland Department of Community Development - Oakland.
12. Representative - Large Retail Store - Oakland.
13. Representative - Savings and Loan Institution - Oakland and San Francisco.
14. Mr. Harry Rhorer - Crocker National Bank - San Francisco, Oakland, Bay Fair.
15. Mr. William McGuire - Wells Fargo Bank - Oakland.
16. Representative - Large Retail Store - Berkeley.
17. Representative - Large Retail Store - Berkeley.
18. Mr. Harry Stoops - Berkeley Chamber of Commerce - Berkeley.
19. Mr. Robert Mann - Cost Plus - Walnut Creek.

44. Unless otherwise noted, all interviews are from John Blayney Associates/ David M. Dornbusch & Company, Inc., Study of Retail Sales and Services (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, April 1978), or Idem, Study of the Office Construction Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977).

20. Representative - Large Retail Store - Fremont.
21. Mr. Al Linberg - Shopping Center Manager - Bay Fair.
22. Mr. Futak - Montgomery Wards - Bay Fair.
23. Mr. Clarke Stone - Macy's - San Francisco, Richmond.
24. Mr. Ben Farnum - The Emporium - San Francisco.
25. Mr. William F. LeFevre - Woolworth's - San Francisco.
26. Mr. Bernard Averbuch - Market Street Development Project - San Francisco.
27. Mr. H. W. Ehlers - Milton Meyer and Company - San Francisco.
28. Mr. Thomas Doherty⁴⁵ - Thomas H. Doherty - San Francisco.
29. Dr. Jenner⁴⁶ - Berkeley Planning Department - Berkeley.

45. Interviewed for John Blayney Associates/David M. Dornbusch & Company, Inc., Study of Property Acquisition and Occupancy (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, April 1978).

46. Interviewed specifically for this study.

APPENDIX B. INTERVIEWS CITED: MAINTENANCE, REHABILITATION, AND NEW CONSTRUCTION

1. Mr. Carl Brune, Jr. - Pacific Gas and Electric Company - San Francisco.
 2. Mr. Bill Cole - Coldwell, Banker and Company - San Francisco.
 3. Mr. H. W. Ehlers - Milton Meyer and Company - San Francisco.
 4. Mr. Bernard Averbuch and Ms. Sharon deZordo - Market Street Development Project - San Francisco.
 5. Mr. Hal Thomas - Systech Corporation - Walnut Creek.
 6. Mr. L. B. Nelson - L. B. Nelson Company - Fremont, Walnut Creek.
 7. Mr. Roy Vance - Kaufman and Broad Company - Pittsburg, Antioch.
 8. Mr. Hartmut Gerdes - Diablo Keys Designer - Walnut Creek.
 9. Mr. Carlos Zocchi - Zocchi Building Contractors - Walnut Creek, Concord.
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SOURCES: Interview 1: John Blayney Associates/David M. Dornbusch & Company, Inc., Study of Employers' Locational Decisions (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, March 1978); interviews 2 through 4: Idem, Study of the Office Construction Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper, August 1977); interviews 5 through 9: Idem, Study of the Housing Industry (Berkeley: BART Impact Program Land Use and Urban Development Project Working Paper (September 1977).

APPENDIX C. QUESTIONS FROM KEY INFORMANT INTERVIEWS RELATING TO BART'S CONSTRUCTION IMPACTS

Questions From Study of Retail Sales and Services:

XIV. IF IN BUSINESS HERE DURING BART CONSTRUCTION PERIOD:

CLIENTELE

1. Did the volume of people moving in and out of your place of business increase or decrease?
2. Was there a difference in the clientele served by your business—age, sex, racial/ethnic identity, income level, area of residence? What change?
3. Were your sales or receipts lowered or increased during the period of construction?

XV. IF IN BUSINESS DURING BART CONSTRUCTION PERIOD:

OPERATING PROCEDURES

1. Were there changes in the business days or hours? What changes?
2. Were there changes in prices? What changes?
3. Were there changes in your advertising? What changes?
4. Were there layoffs of employees or increases in number of employees?

Questions From Study of Employers' Locational Decisions:

VIII. IF IN BUSINESS NEAR BART DURING BART CONSTRUCTION PERIOD:

1. What effect did BART construction have on your operation?

Negative effects such as: poorer access; noise; traffic rerouting, etc.

Positive effects such as: traffic rerouting etc.
2. Were there changes in the business days or hours because of construction? What changes?
3. Were there delays or elimination of maintenance, rehabilitation, or new construction?

4. Were there changes in staffing? Numbers? Type? Turnover?
5. What other types of changes in procedures were there?

Questions From Study of the Housing Industry:

5. Did BART have any influence on your project(s)' location? Density? Price range? Timing? Could you explain how?
15. Thinking about recent development adjacent to the BART line, can you recall any instances when a developer's decision was influenced by potential adverse effects of BART, such as train noise?

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